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The Experiential Value Assessment Scale (ExVaS): Development and Psychometric Evaluation of a Scale for Assessing Experiential Value in Product Use

Toshihisa Doi

tdoi@omu.ac.jp

Osaka Metropolitan University https://orcid.org/0000-0002-9272-1985

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Title

The Experiential Value Assessment Scale (ExVaS): Development and Psychometric Evaluation of a Scale for Assessing Experiential Value in Product Use

Author and affiliation

Toshihisa Doi

Dept. of Living Environment Design, Graduate School of Human Life and Ecology, Osaka Metropolitan University

Corresponding author

Toshihisa Doi

tdoi@omu.ac.jp

Dept. of Living Environment Design, Graduate School of Human Life and Ecology, Osaka Metropolitan University

3-3-138 Sugimoto, Sumiyoshi-ku, Osaka 558-8585, Japan

Abstract

Existing UX scales mainly address perceived product quality, attractiveness, and emotional reactions, whereas experiential value scales have mainly targeted purchase and consumption. This study developed the Experiential Value Assessment Scale (ExVaS) to assess the value that users gain from continued use of products. Candidate items were created from 30 categories of experiential value extracted inductively from users' descriptions of memorable experiences with products used for six months or longer. In a web survey of 1,054 respondents in Japan, exploratory factor analysis (n = 680) yielded 44 items in seven factors: Social Fulfillment, Self-Growth, Relaxation, Curiosity, Surprise, Nostalgia, and Everyday Fit. Confirmatory factor analysis in an independent sample (n = 374) supported this structure to a certain extent (CFI = .881, RMSEA = .078), although discriminant validity was limited for some factor pairs. Cronbach's α ranged from .899 to .961, and test-retest ICC(2,1) ranged from .592 to .786 (n = 194). Factor scores were higher for satisfying experiences than for less satisfying ones (d = 0.97 to 2.22). These results suggest that ExVaS has basic psychometric properties for capturing experiential value. Validation with existing scales, other products and periods of use, and actual use settings remains for future work.

Keywords

HCI design and evaluation methods; User experience; Experiential value; Scale development; Psychometric evaluation

1. Introduction

User experience (UX) is an important concept for understanding the relationship between users and products, systems, or services in human-centered design. ISO 9241-210 (2019) defines UX as a person's perceptions and responses that result from the use or anticipated use of a system, product, or service. UX is not limited to ease of use or usefulness. It also includes users' subjective experiences during use, such as emotions, perceptions, and expectations. Hassenzahl and Tractinsky (2006) argued that UX depends on the user's internal state, the characteristics of the product, and the context of use. Law et al. (2009) showed, through expert opinions, that UX is a complex concept. Forlizzi and Battarbee (2004) and McCarthy and Wright (2004) also proposed views that treat the experience arising from interaction with products and technologies as connected to daily life, to relationships with other people, and to the meaning that users give to the experience. Thus, to understand UX, we need to look not only at the properties of a product but also at how users experience their interaction with it.

Interest in the experience of using a product has expanded. In addition to task effectiveness, efficiency, and usability, researchers now also consider subjective experiences that arise from interaction with products, such as emotional and aesthetic aspects. In consumer research, Holbrook and Hirschman (1982) emphasized the feelings, fantasies, and fun involved in consumption. Schmitt (1999) proposed a view of experience that includes sensory, affective, cognitive, behavioral, and relational aspects. Pine and Gilmore (1998) discussed the economic value of experiences, and Jordan (2000) organized the different aspects of pleasure that products provide. In UX research, Hassenzahl (2003, 2004) presented a framework that explains the perceived quality of a product in terms of pragmatic quality and hedonic quality. Thüring and Mahlke (2007) organized the relationships among product characteristics, perceived qualities, and emotional reactions. Desmet (2012) also classified positive emotions that arise from interaction with products into 25 types and showed the variety of emotions that product use can bring. These studies show that it is important to understand the wide range of subjective experiences that arise through interaction with products, beyond evaluating the functions and operability of products.

UX is not limited to impressions or reactions at a single point in time. It also has a temporal nature, and it changes as users continue to use a product or service. Karapanos et al. (2009) studied the process from the early stage of product use to continued use. They showed that the aspects on which users evaluate a product, and their relationship with the product, change over time. Yoon et al. (2020) focused on positive UX across the lifecycle of product use and examined the characteristics of experience at each stage of use. These studies show that, to understand UX, it is important to consider not only evaluations in a specific situation of use but also the length of use and the accumulation of experience.

UX research has examined not only evaluations of ease of use and attractiveness, but also which psychological needs are satisfied through interaction with a product and what meaning the experience has for the user. Regarding psychological needs, self-determination theory identifies

autonomy, competence, and relatedness as basic needs (Ryan & Deci, 2000). Sheldon et al. (2001) examined the relationship between satisfying events and the fulfillment of psychological needs. In UX research, Hassenzahl et al. (2010) analyzed more than 500 positive experiences with interactive products. They showed that the fulfillment of needs such as stimulation, relatedness, competence, and popularity is related to positive affect. Mekler and Hornbæk (2016) analyzed 266 experiences of technology use and compared hedonic and eudaimonic experiences. They showed that eudaimonic experience is related to the pursuit and achievement of personal goals and to the meaning of the experience. Mekler and Hornbæk (2019) also organized the experience of meaning in interaction with technology into five facets: connectedness, purpose, coherence, resonance, and significance. Against this background, Desmet and Pohlmeyer (2013) discussed design for well-being based on three components: pleasure, personal significance, and virtue. Peters et al. (2018) proposed the METUX model, which supports motivation and well-being through the fulfillment of psychological needs.

To understand these aspects of UX, research and practice have used both qualitative methods, such as observation and interviews, and quantitative methods, such as questionnaire scales. Vermeeren et al. (2010) reviewed the current state and challenges of UX evaluation methods. Bargas-Avila and Hornbæk (2011) showed that empirical UX studies deal with a wide variety of evaluation concepts. Pettersson et al. (2018) also examined how to select and combine methods in UX evaluation. Qualitative methods are useful for understanding the context and meaning of individual experiences. In contrast, questionnaire scales collect responses from many people on a common evaluation axis for a defined construct, and they make it possible to compare differences between products or conditions quantitatively. The usefulness of a scale depends on whether the constructs and items are appropriately defined for the purpose of evaluation.

Subjective UX scales have developed from questionnaires for measuring usability and user satisfaction. For example, the Questionnaire for User Interaction Satisfaction (QUIS) was developed to assess users' satisfaction with an interface (Chin et al., 1988). The Software Usability Measurement Inventory (SUMI) targets the usability of software (Kirakowski & Corbett, 1993), and the System Usability Scale (SUS) offers a simple way to assess perceived usability (Brooke, 1996). The Standardized User Experience Percentile Rank Questionnaire (SUPR-Q), which targets websites, assesses trust, appearance, and loyalty in addition to usability (Sauro, 2015). These scales measure users' subjective evaluations with standardized questions. They have been used to compare and improve products and services.

Scales that capture the perceived quality of a product or overall UX from multiple perspectives include AttrakDiff and the User Experience Questionnaire (UEQ). AttrakDiff was proposed to measure pragmatic quality, hedonic quality, and related aspects (Hassenzahl et al., 2003). The UEQ evaluates six dimensions: attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty (Laugwitz et al., 2008). For the UEQ, studies have examined its use in different evaluation scenarios (Schrepp et al., 2014), developed a benchmark (Schrepp et al., 2017a), and created a short version, the UEQ-S (Schrepp et al., 2017b). Its factor structure has also been re-examined (Schankin

et al., 2022). The meCUE is based on the Components of User Experience (CUE) model. It treats product perceptions, emotions, consequences of use, and overall evaluation as separate modules (Minge et al., 2017). An English version was validated (Minge et al., 2016), and the scale was revised as the meCUE 2.0 (Minge & Thüring, 2018). These scales provide ways to quantify several UX components beyond usability along predefined evaluation axes.

The development of UX scales has moved not only toward capturing multiple UX components comprehensively, but also toward measuring specific aspects in detail. For example, Moshagen and Thielsch (2010) developed the Visual Aesthetics of Websites Inventory (VisAWI) to measure the visual aesthetics of websites, and Perrig et al. (2024b) developed and validated the VisAWI-Pos, a version with positively worded items. Mortazavi et al. (2024) developed and validated four scales for the social aspects of using interactive products: Identification, Social interaction, Social stimulation, and Social acceptance. Psychological fulfillment and the meaning of experience that products and services bring to users have also become targets of measurement. Huang et al. (2025) developed the Fundamental User Needs (FUN) Scales, which measure the satisfaction and frustration of 13 psychological needs in design-mediated interactions. In addition, scales for eudaimonic experience in technology use have been proposed, such as the Eudaimonic Technology Experience Scale (ETES; Woźniak et al., 2023) and the Eudaimonic Interaction Inventory (EII; Jörs & De Luca, 2025). Thus, research on scales for specific aspects of UX covers a wide range of constructs, from the aesthetics and social aspects of products to the fulfillment of psychological needs and the meaning of experience.

Overall, subjective UX scales have developed to measure a wide variety of constructs, and it is important to choose a scale according to the purpose of the evaluation. Díaz-Oreiro et al. (2021) reviewed studies that used standardized UX questionnaires, and Hinderks et al. (2019) examined the applicability of questionnaires according to the target and purpose of evaluation. Lallemand et al. (2015) reported that researchers and practitioners do not share a uniform understanding of the UX concept. Perrig et al. (2024a) systematically reviewed the use of UX scales in CHI papers. They pointed out problems in how studies report the reasons for choosing a scale and the quality of measurement. Based on these studies, it is important to understand which aspects of experience a scale measures in light of the purpose of evaluation, in addition to its reliability and validity.

One perspective for evaluating UX is the value gained through experience (experiential value). Studies in consumer research have also measured experiential value quantitatively. Mathwick et al. (2001) developed the Experiential Value Scale (EVS) for the experience of catalog and Internet shopping. It consists of aesthetics, play, customer return on investment, and service excellence. Varshneya and Das (2017) proposed the CEXPVALS, which has four dimensions: cognitive, hedonic, social, and ethical value. These studies provide frameworks for capturing the value gained from experience from several aspects and for evaluating it quantitatively.

When we try to understand the experience of using a product or service, it is meaningful to look not only at an overall evaluation of how attractive the experience was, but also at what kind of experiential value users feel they gained from it. For example, two products may be rated as equally

attractive, but one may be seen as an experience of learning something new, and the other as a calming experience. In addition, with continued use of a product or service, the accumulation of experience may make the product part of daily life, or may give new meaning to the relationship with oneself or with others. The EVS and CEXPVALS were mainly developed in the context of purchase and consumption. In the experience of using products and services, too, it is important to capture concretely what value users find. Therefore, this study aims to organize the content of the value gained from actual use experience based on users' own experiences, and to evaluate its type and degree quantitatively.

In this study, experiential value is defined as the psychological fulfillment, emotional change, relationships with oneself and others, and meaning in daily life that users subjectively perceive through interaction with, and continued use of, a product or service. This study does not address either the attributes of the product itself or an overall evaluation of the experience as a single score. Rather, it addresses the content of the value that users find in their experience. Some aspects of experiential value may overlap with the fulfillment of psychological needs, eudaimonic experience, and value in consumption experiences. However, this study does not limit its scope in advance to a specific classification. Instead, I organize candidates for experiential value, starting from experiences described by the users themselves.

The starting point of this study is Doi (2026). In that study, I collected responses with a sentence completion test about memorable positive experiences with products and services that participants had used for more than six months. From the responses of 438 participants, I extracted 1,316 statements about experiential value and organized them into 30 categories using affinity diagramming. These categories were grouped into six higher-level categories: practical value, emotional and affective value, self-growth and intrapersonal value, value in the context of everyday life, social and relational value, and physical value. That study presented candidates for experiential value based on users' own descriptions. However, it did not examine scale items, factor structure, or measurement properties for quantitatively measuring each category. Categories extracted inductively do not necessarily hold as factors of a psychological scale. Therefore, the operationalization into scale items and empirical examination are needed.

Scale development requires the creation of items that represent the construct, and the examination of multiple kinds of evidence on factor structure, reliability, and validity (Clark & Watson, 1995; Boateng et al., 2018). It is also important to use exploratory and confirmatory factor analyses appropriately (Worthington & Whittaker, 2006). Therefore, this study aimed to develop the Experiential Value Assessment Scale (ExVaS) based on the experiential value categories extracted by Doi (2026), and to examine its psychometric properties. ExVaS assesses the value that users subjectively gain from the experience of using products and services from multiple aspects. Specifically, I created candidate items, selected items and factors by exploratory factor analysis, conducted confirmatory factor analysis with independent data, and evaluated internal consistency and test-retest reliability. In addition, I examined how factor scores differ between satisfying and less

satisfying experiences, and clarified the possibilities and challenges of the scale for assessing experiential value.

A feature of this study is that it focuses on the experiential value gained from continued use of products and services, and builds the scale on concepts that were extracted inductively from users' own descriptions of their experiences. The scale is related to the perceived quality, attractiveness, and emotional reactions that conventional UX scales have addressed. At the same time, it offers a different perspective: evaluating the type and degree of value gained from the experience of use. In addition, the experiential value scales in consumer research have mainly been developed for the context of purchase and consumption. In contrast, this study targets experiences after continued use of products and services, and aims at use in UX evaluation and design. With this scale, it is expected that we can understand concretely what users value through their interaction with products and services, and that this will contribute to understanding the experience of use and improving design.

2. Methods

2.1. Overview of scale development

This study developed the scale in four stages (Fig. 1). In the first stage, the concept of experiential value was extracted inductively through a sentence completion test (Doi, 2026). In the second stage, candidate items were created based on the 30 categories identified by Doi (2026). In the third stage, a web survey (n = 1,054) was conducted (Survey 1), and exploratory and confirmatory factor analyses were performed. Through these analyses, the factor structure was examined, and a final set of 44 items with seven factors was determined. Internal consistency was also checked. In the fourth stage, to validate the developed items, a test-retest reliability survey (n = 194; Survey 2) and a comparison survey between satisfying experiences (n = 95) and less satisfying experiences (n = 56) (Survey 3) were conducted to examine whether the scale could differentiate between the two kinds of experiences.

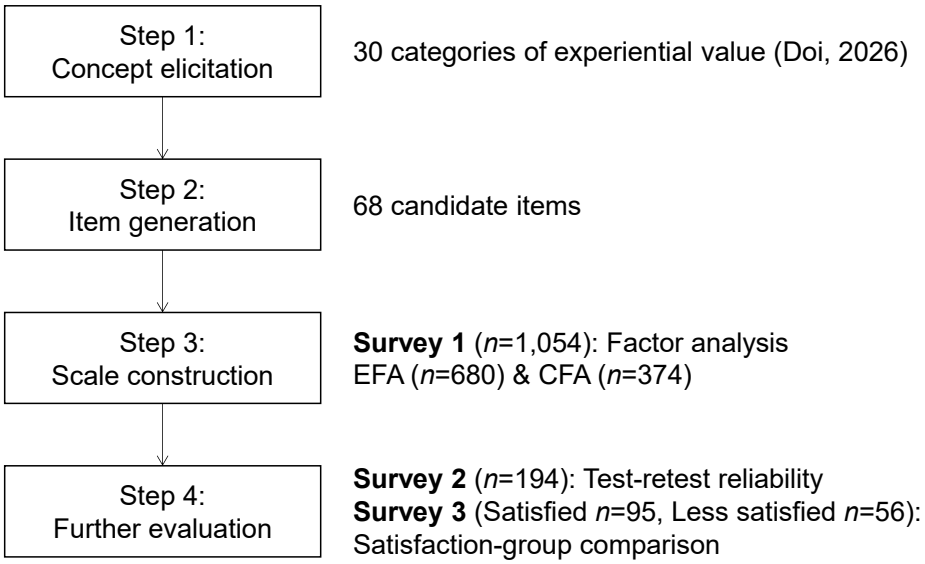


Fig 1. Procedure of scale development

2.2. Development of initial scale items

Candidate items were created based on the 30 categories of experiential value obtained by Doi (2026). In that study, participants freely chose one product or service that they had used for more than six months and with which they had a good and memorable experience. They then described the experience with a sentence completion test, covering their impression when they started using it, changes after use and after becoming accustomed to it, what was memorable and why, and what the experience meant to them. The meaning of the obtained text data was interpreted, and concept labels representing experiential value were assigned (1,316 experiential values were extracted). These were then categorized by affinity diagramming. As a result, 30 intermediate-level categories were identified, and they were grouped into six higher-level categories: practical value, emotional and affective value, self-growth and intrapersonal value, value in the context of everyday life, social and relational value, and physical value.

For the 30 categories of experiential value, three items were created for each category, resulting in 90 candidate items. To fit the purpose of evaluating respondents' experiential value, every item was written with the experience, rather than the product or service, as the subject. For the predicate and tense of each item, I referred to each category and the concept labels from which it was derived. Each item was then organized into one of three forms: asking about past facts or perceptions that actually occurred during the experience, asking how the respondent currently evaluates the experience in retrospect, or asking whether the effects or perceptions obtained are still continuing at present. Because 90 items were too many for a web survey, items with large overlap in meaning within a category and items with similar meanings across categories were deleted. Finally, 68 items were selected as candidates (Appendix A).

2.3. Scale construction and factorial validation (Survey 1)

2.3.1. Participants and procedure

A web survey was conducted from May 21 to May 28, 2026, with 1,500 participants through a research company (iBRIDGE Co., Ltd.). Participants were people who had used at least one product or service (e.g., home appliances, digital devices, daily necessities, and apps other than games) for six months or longer. Each participant selected one of them and reported its product category, product name, duration of use, the time of last use, and overall satisfaction. They then answered 68 questions about their experience of using it.

Invalid responses were excluded from the 1,500 responses based on the following criteria. Responses were retained only if (1) the participant answered both of the two instructional manipulation check (IMC) items correctly, (2) the duration of use was six months or longer, and (3) the product name was valid (blank or meaningless answers were excluded). The final sample consisted of 1,054 valid responses (542 women and 512 men), with a mean age of 48.3 years (SD = 12.1). The most common product categories were smartphones and tablets (n = 568, 54%), personal computers and peripherals (n = 236, 22%), and home appliances (n = 72, 7%). The mean overall satisfaction (7-point

scale) was 5.46.

For the analyses, the valid responses were randomly divided into a dataset for exploratory factor analysis (EFA; n = 680) and a dataset for confirmatory factor analysis (CFA; n = 374). The two datasets did not overlap. The composition of gender and age was similar between them (EFA: 351 women and 329 men, mean age = 48.3 years, SD = 12.0; CFA: 191 women and 183 men, mean age = 48.3 years, SD = 12.5).

2.3.2. Questionnaire

The questionnaire consisted of the following parts. Participants were asked about the product category (Q1; 10 options: smartphones and tablets, personal computers and peripherals, TV and audio equipment, cameras and video equipment, home appliances, game consoles, wearable devices, daily necessities, apps, and others), the product name (Q2; free text), the duration of use (Q3; 5 options: less than 6 months, 6 months to less than 1 year, 1 year to less than 2 years, 2 years to less than 3 years, and 3 years or more), the time of last use (Q4), and overall satisfaction (Q5; 7-point Likert scale from 1 = very dissatisfied to 7 = very satisfied). Next, participants rated the 68 items selected as candidate scale items on how well each item applied to their experience of using the product, on a 7-point Likert scale (1 = does not apply at all to 7 = applies very well). To exclude invalid responses, two IMC items were inserted among the 68 items. The questionnaire was written entirely in Japanese and administered to Japanese speakers. The English translations of the items are provided in Appendices A and B for reference only.

2.3.3. Exploratory factor analysis

Exploratory factor analysis (EFA) was conducted to explore the factor structure of the scale and to select scale items. The 68 candidate items were analyzed (the ratio of participants to items was 10:1). Before the analysis, the applicability of factor analysis was examined with the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity, and the data were judged to be suitable for factor analysis. The initial number of factors was determined with reference to the eigenvalue-greater-than-1 criterion, the scree plot, and parallel analysis (Monte Carlo method, 100 iterations). Several solutions were then compared, and the final number was decided based on model fit and interpretability. Maximum likelihood estimation was used for factor extraction, and promax rotation (power = 4), which allows factors to be correlated, was used for rotation. The analysis was performed with HAD 18.0.

Items were judged with the following four criteria: (1) items that did not show a factor loading of .40 or higher on any factor, (2) items that showed factor loadings of .40 or higher on more than one factor, (3) items with a communality lower than .40, and (4) items that did not match the conceptual content of the factor. Items meeting these criteria were deleted, and the analysis was repeated to determine the final items and factors. CFI and RMSEA were referred to as reference indices of model fit.

2.3.4. Confirmatory factor analysis

The factor structure obtained by the EFA was tested with the CFA dataset (n = 374), which was independent of the EFA dataset. The model was specified based on the correspondence between items and factors determined in the EFA, and each item was allowed to load only on the one factor to which it was assigned in the EFA. The correlations among factors were freely estimated (an oblique model). Maximum likelihood estimation was used with the lavaan package in R. Before the estimation, the distributions of the items (skewness and kurtosis) were checked.

Model fit was evaluated with CFI, TLI, RMSEA, SRMR, AIC, and BIC. Based on the fit of the initial model, modification indices were referred to, and error covariances were specified only for item pairs whose relationship could be explained conceptually. Even when a modification index was large, no error covariance was specified for a pair without a conceptual rationale, and no cross-loadings were added. For the pairs that were specified, the modification indices were checked and the model was re-estimated several times. The final set was determined by considering the improvement in model fit, the conceptual explainability, and the simplicity of the model. Because scale scores are calculated as the simple mean of the items in each factor, specifying error covariances does not affect the scores.

To examine the discriminant validity of the factors, the model adopted in the CFA was used as the reference model and compared with the following alternative models: (a) models in which two factors were merged (all 21 pairs), (b) a model in which pairs of highly correlated factors were merged, (c) a model in which all items loaded on a single factor, and (d) a second-order model in which a single general factor was placed above the factors. The same error covariances as in the reference model were specified in all alternative models. For model comparison, the χ^2 difference test, differences in CFI and RMSEA, AIC, and BIC were used. In addition, the average variance extracted (AVE) and composite reliability (CR) of each factor and the heterotrait-monotrait (HTMT) ratio between factors (Henseler et al., 2015) were calculated. The criterion of Fornell and Larcker (1981) was examined from the relationship between AVE and the squared correlations between factors (the maximum shared variance, MSV).

2.3.5. Internal consistency

The internal consistency of each factor was evaluated with Cronbach's α. It was calculated for each factor using all valid responses of Survey 1 (n = 1,054). The scale score of each factor was the simple mean of the items belonging to that factor. A total score (the sum of all items) is not used. Instead, scores are calculated for each factor to describe the content of the experience by factor.

2.4. Evaluation of additional measurement properties

2.4.1. Test-retest reliability (Survey 2)

To examine test-retest reliability, 300 respondents of Survey 1 were randomly selected, and a follow-up survey with the same questionnaire was conducted (Survey 2). In Survey 2, participants were instructed to answer about the same product as in Survey 1. The questionnaire consisted of the 44 items

determined in Survey 1 and two IMC items, and the order of the items was the same as in Survey 1. Survey 2 was conducted on June 2, 2026, at least five days after the response period of Survey 1.

Of the 300 respondents, those who answered the IMC items incorrectly (n = 41), gave invalid responses (n = 1), or answered about a product different from that in Survey 1 (n = 64) were excluded. The remaining 194 respondents (100 women and 94 men; mean age = 47.2 years, SD = 12.5) were analyzed. For each factor, the intraclass correlation coefficient was calculated as the evaluation index. Specifically, ICC(2,1), which is the single-measures, absolute-agreement coefficient under a two-way random-effects model, and its 95% confidence interval were calculated. The single-measures coefficient was used because, in actual use, a single measurement is used as the scale score. In addition, to check for a systematic shift between measurement occasions, the effect of the measurement occasion (treated as a rater factor) was tested in a two-way analysis of variance.

2.4.2. Differentiation between satisfying and less satisfying experiences (Survey 3)

A comparison survey (Survey 3) was conducted to examine whether the scale can differentiate between satisfying and less satisfying experiences. ExVaS is not intended to be an overall evaluation, and satisfaction was not treated as a criterion that each factor should match. Instead, this survey was based on the following assumption. If two groups of experiences differ in satisfaction, then, when many different experiences are rated and averaged, differences are also likely to appear in many types of experiential value. Therefore, if the scale reflects the value gained from experience, the factor scores should tend to be higher for satisfying experiences than for less satisfying ones. This comparison is a basic check based on this assumption. It does not examine whether each factor can differentiate experiences that differ in that specific type of value.

The web questionnaires for the satisfied group and the less satisfied group were distributed as separate surveys, so that respondents did not know the condition of each group. The satisfied group was asked to think of one product or service that they had used for one month or longer and were satisfied with. The less satisfied group was asked to think of one product or service, currently or previously used, with which they were dissatisfied. The category of the product or service was not restricted, and respondents chose freely. After entering the name of the product or service, respondents answered the overall satisfaction question (7-point scale) and the 44 items (7-point scale) about the experience.

The survey was conducted with 158 respondents in each group. Valid responses were selected based on incorrect answers to the IMC items, invalid product names, and the overall satisfaction rating. Overall satisfaction ratings of 5–7 were used for the satisfied group, and 1–4 for the less satisfied group. As a result, the satisfied group (n = 95; 44 women and 51 men; mean age = 44.2 years, SD = 14.6) and the less satisfied group (n = 56; 26 women and 30 men; mean age = 48.8 years, SD = 16.5) were analyzed. An independent-samples t-test was conducted on the scale score of each factor.

2.5. Ethical considerations

This study was approved by the Ethics Committee of the Graduate School of Human Life and Ecology, Osaka Metropolitan University (approval number: 2026-26). Surveys 1 to 3 were approved under a common approval number. In all surveys, before answering, participants were informed of the purpose of the study, that participation was voluntary, how the data would be handled, and so on. They indicated consent by pressing a consent button and then started the survey.

3. Results

3.1. Factor structure and item selection

For the 68 items in the EFA data (n = 680), the KMO measure was .972, and Bartlett's test of sphericity was $\chi^2(2278) = 46{,}962.2$, $p < .001$, so factor analysis was judged to be applicable. For the number of factors, the eigenvalue-greater-than-1 criterion suggested nine factors, parallel analysis suggested five, and the elbow of the scree plot was around five. Based on parallel analysis and the scree plot, a five-factor solution was first adopted as the initial solution (CFI = .811, RMSEA = .081). With maximum likelihood estimation and promax rotation, item deletion and reanalysis were repeated using the criteria described in Section 2.3.3. In this process, the number of factors was examined while checking model fit and the interpretability of the factors. After 24 items were deleted, a seven-factor model with 44 items was obtained (Table 1). The fit of the seven-factor model was $\chi^2(659) = 3{,}335.6$, CFI = .905, and RMSEA = .079. The KMO measure for the 44 items was .963. Each item showed a factor loading of .434 to 1.016 on the factor on which it mainly loaded (some loadings exceeded 1.0 because of the oblique rotation), and its loadings on the other factors were all below .40. Communalities ranged from .362 to .914. Only *intuitive_use* had a communality (.362) below the criterion (.40), but it was retained as an exception to keep content related to practical usefulness. The correlations among the factors ranged from .316 to .691.

The factors were interpreted and named as follows. F1 "Social Fulfillment" (13 items) represents experiences gained from relationships with other people and society, such as *social_contribution*, *peer_recognition*, *others_warmth*, *gratitude*, and *connection_joy*. F2 "Self-Growth" (9 items) concerns experiences of one's own growth and change, such as *accomplishment*, *self_confidence*, *self_expression*, and *challenge*. F3 "Relaxation" (3 items) consists of *tension_relief*, *relaxation*, and *healing*. F4 "Curiosity" (3 items) consists of *curiosity_stimulation*, *new_encounters*, and *world_expansion*. F5 "Surprise" (3 items) consists of *exceeded_expectations*, *reframing*, and *positive_surprise*. F6 "Nostalgia" (3 items) consists of *nostalgia*, *memory_evocation*, and *memory_bonding*. F7 "Everyday Fit" (10 items) represents that the product or service has become rooted in daily life, as shown by *life_integration*, *daily_habit*, *indispensable*, *attachment*, and *long_term_intent*.

Table 1. Final 44 items: EFA pattern loadings and communalities (n = 680) and CFA standardized loadings (n = 374)

Item (abbreviation)	F1	F2	F3	F4	F5	F6	F7	Communality	CFA standardized loading
F1 Social Fulfillment (13 items)									
social_contribution	**.940**	.070	-.075	-.092	-.022	-.040	-.021	.732	.812
peer_recognition	**.934**	.089	-.091	-.068	-.000	-.018	-.085	.768	.877
others_warmth	**.903**	-.075	-.016	.048	-.034	.046	-.007	.778	.884
social_esteem	**.902**	.110	-.038	-.092	-.023	-.008	-.024	.775	.859
environmental_care	**.843**	-.091	.047	-.201	.059	-.021	.119	.593	.777
well_groomed	**.752**	.109	-.057	-.174	.095	.068	-.072	.623	.741
gratitude	**.743**	-.033	.126	.061	.022	-.054	.042	.696	.854
social_trigger	**.717**	-.063	.006	.179	-.050	.057	-.016	.635	.739
family_friend_bond	**.702**	-.102	.110	.154	-.065	-.013	.031	.591	.712
ownership_pride	**.669**	.217	-.007	.028	.059	-.093	.038	.702	.805
heart_warmth	**.669**	-.149	.256	.013	-.038	.056	.138	.691	.821
enhanced_attractiveness	**.667**	.256	.022	-.040	-.016	-.001	.008	.704	.818
connection_joy	**.641**	-.055	.037	.169	-.001	.113	.007	.674	.765
F2 Self-Growth (9 items)									
accomplishment	-.017	**.914**	-.056	.054	-.052	-.015	.044	.775	.819
self_confidence	.159	**.759**	.017	.025	.017	-.044	-.046	.748	.825
self_expression	.141	**.656**	.075	-.074	-.044	.078	.116	.713	.864
creative_expression	.243	**.648**	-.153	-.040	.018	.106	.064	.658	.779
customization	.155	**.625**	-.265	.095	.073	.033	.077	.555	.699
positive_self_view	.173	**.609**	.147	.079	-.077	-.078	.109	.743	.837
creative_use	-.006	**.572**	-.057	.109	.060	-.010	.209	.596	.730
overcoming_weakness	.399	**.441**	.021	.079	.048	-.028	-.156	.616	.793
challenge	.366	**.434**	.120	.096	.048	-.041	-.153	.675	.821
F3 Relaxation (3 items)									
tension_relief	.056	-.068	**.942**	.022	.009	.024	-.064	.864	.916
relaxation	.074	-.035	**.920**	-.066	.001	-.058	.081	.839	.866
healing	.014	-.112	**.731**	.081	.047	.053	.104	.716	.891
F4 Curiosity (3 items)									
curiosity_stimulation	-.072	.139	.001	**.869**	-.015	.015	.009	.854	.903
new_encounters	-.031	.037	-.018	**.820**	.024	-.008	.052	.735	.810
world_expansion	-.007	.100	.028	**.782**	-.031	.063	.007	.788	.922
F5 Surprise (3 items)									

exceeded_expectations	-.006	.012	-.001	-.082	**.857**	.023	.088	.746	.841
reframing	.091	-.006	.020	-.007	**.846**	.018	-.104	.768	.859
positive_surprise	.011	.050	.043	.102	**.752**	-.037	.034	.783	.886
F6 Nostalgia (3 items)									
nostalgia	.081	-.044	.011	-.045	.012	**.955**	-.038	.914	.879
memory_evocation	.044	.015	-.016	.082	.004	**.828**	-.010	.826	.898
memory_bonding	.075	.063	-.003	.033	-.002	**.724**	.078	.748	.888
F7 Everyday Fit (10 items)									
daily_habit	.087	-.157	-.164	.016	.011	-.036	**1.016**	.796	.783
life_integration	.090	-.117	-.180	.036	-.041	-.045	**1.013**	.794	.796
indispensable	.110	-.130	-.108	.157	.064	-.005	**.802**	.723	.814
long_term_intent	.032	-.010	.049	.127	-.007	-.024	**.696**	.652	.865
intuitive_use	-.068	.199	.053	-.246	-.051	.072	**.609**	.362	.554
long_term_trust	-.041	.148	.186	-.216	-.040	.054	**.585**	.431	.746
attachment	-.008	.021	.145	.152	.050	.059	**.517**	.634	.830
meaningful_choice	-.173	.339	.144	.054	.002	-.028	**.517**	.640	.771
style_fit	-.100	.264	.205	-.010	.031	.004	**.503**	.631	.798
effortless_realization	-.170	.282	.102	-.084	.027	-.016	**.495**	.407	.741
Factor correlations (EFA)									
F1	—								
F2	.659	—							
F3	.586	.675	—						
F4	.565	.606	.618	—					
F5	.588	.691	.592	.588	—				
F6	.639	.512	.582	.638	.482	—			
F7	.316	.508	.575	.635	.421	.389	—		

Note. Values are from the factor pattern matrix. Loadings of .40 or higher are in bold. FA: HAD 18.0; extraction = maximum likelihood; rotation = promax (power = 4); KMO = .963. CFA standardized loadings are from the final model (six error-covariance pairs specified) fitted to the CFA data (n = 374).

3.2. Model fit of the seven-factor structure

The seven-factor oblique model with 44 items was tested with the CFA data (n = 374), which were independent of the EFA data (Table 2). The initial model, in which no error covariances were specified, showed CFI = .849, TLI = .838, RMSEA = .088 (90% CI [.085, .091]), and SRMR = .064. With reference to the modification indices, error covariances were specified for six item pairs whose relationships could be explained conceptually (*life_integration* and *daily_habit*, *family_friend_bond* and *connection_joy*, *overcoming_weakness* and *challenge*, *creative_expression* and *customization*, *social_contribution* and *environmental_care*, and *accomplishment* and *self_confidence*). The

standardized error covariances ranged from .375 to .607. The final model with these error covariances showed CFI = .881, TLI = .871, RMSEA = .078 (90% CI [.075, .081]), and SRMR = .061. Both AIC and BIC were smaller than those of the initial model (AIC: 41,894.0 → 41,361.5; BIC: 42,321.7 → 41,812.8). RMSEA and SRMR met the common guideline (.08 or lower), whereas CFI and TLI were slightly below .90. The standardized factor loadings of all items were .554 to .922 (mean = .816; Table 1).

Table 2. Fit indices of the initial and final seven-factor CFA models (n = 374)

Index	Initial model	Final model
CFI	.849	.881
TLI	.838	.871
RMSEA	.088	.078
RMSEA 90%CI	[.085, .091]	[.075, .081]
SRMR	.064	.061
AIC	41,894.0	41,361.5
BIC	42,321.7	41,812.8

Note. Initial model: 44 items, seven factors, no error covariances. Final model: the same model with six item-pair error covariances specified. Estimation: maximum likelihood (lavaan).

To examine the discriminant validity of the factors, the final model was compared with alternative models (Table 3). The final model fit better than any of the models in which factors were merged. In the models in which two factors were merged, χ^2 became significantly worse for all 21 pairs ($\Delta\chi^2(6)$ = 142.6 to 1,883.3, all $p < .001$), and the one-factor model showed poor fit (CFI = .678, RMSEA = .127). When F2 and F5, which were highly correlated, were merged, ΔCFI was −.008, and when F1 and F2 were merged, ΔCFI was −.032. The five-factor model in which F1, F2, and F5 were merged (CFI = .832) and the second-order factor model (CFI = .867, $\Delta\chi^2(14)$ = 241.6) also fit worse than the final model. The AVE of each factor ranged from .600 to .795, and CR ranged from .897 to .960, exceeding the commonly used criteria of .50 and .70, respectively. However, for F2 and F5 (factor correlation r = .893, HTMT = .894) and for F1 and F2 (r = .846, HTMT = .850), the factor correlation exceeded the square root of the AVE of each factor (the Fornell–Larcker criterion), and discriminant validity was limited. The HTMT values for the other factor pairs were .80 or lower.

Table 3. Comparison of the final model with alternative models (n = 374)

Model	χ^2	df	$\Delta\chi^2$	Δdf	CFI	ΔCFI	RMSEA	ΔAIC	ΔBIC
M1 Seven-factor (final)	2,881.9	875			.881		.078		
M0 Seven-factor (no error covariances)	3,426.4	881	544.5	6	.849	-.032	.088	532.5	509.0
Merged: F1+F2	3,432.3	881	550.5	6	.848	-.032	.088	538.5	514.9
Merged: F2+F5	3,024.5	881	142.6	6	.873	-.008	.081	130.6	107.0
Merged: F2+F3	3,213.4	881	331.5	6	.861	-.019	.084	319.5	295.9
Merged: F4+F6	3,225.5	881	343.6	6	.861	-.020	.084	331.6	308.1
Merged: F1+F6	3,309.7	881	427.8	6	.856	-.025	.086	415.8	392.3
Merged: F1+F2+F5	3,714.8	886	832.9	11	.832	-.049	.093	810.9	767.7
One-factor	6,316.6	896	3,434.7	21	.678	-.203	.127	3,392.7	3,310.3
Second-order (seven factors → general factor)	3,123.5	889	241.6	14	.867	-.014	.082	213.6	158.7

Note. All models were estimated by maximum likelihood with the CFA data (n = 374). M1 is the final seven-factor model with six error covariances, and M0 is the same model without error covariances. In the alternative models, the same six error covariances as in M1 were specified. "Merged" indicates that the factors shown were combined into one factor. One-factor: all 44 items load on a single factor. Second-order: the seven factors load on one general factor. $\Delta\chi^2$, ΔCFI, ΔAIC, and ΔBIC are differences from M1 (a positive ΔAIC or ΔBIC indicates a worse model than M1); Δdf is the difference in degrees of freedom. All $\Delta\chi^2$ were significant ($p < .001$). ΔCFI was calculated from unrounded values. Only models with highly correlated factor pairs are shown; the results for all 21 two-factor merged models are described in the text.

3.3. Factor characteristics and internal consistency

Table 4 shows the descriptive statistics of the factor scores, the correlations among the factors, and the internal consistency (Cronbach's α) of each factor, based on the valid responses of Survey 1 (n = 1,054). The skewness of the 44 items ranged from −0.86 to 0.01, and the kurtosis ranged from −0.70 to 1.16. No item had a floor effect exceeding 15%. A ceiling effect exceeding 15% was found only for four items of F7 (*daily_habit*, *life_integration*, *indispensable*, and *long_term_intent*; 17.0% to 22.1%). The Pearson correlations among the factor scores ranged from .396 (F1–F7) to .780 (F1–F2), and all were positive. Cronbach's α ranged from .899 to .961 across all factors.

Table 4. Descriptive statistics, internal consistency, and correlations of factor scores (n = 1,054)

Factor	Items	α	M	SD	F1	F2	F3	F4	F5	F6	F7
F1 Social Fulfillment	13	.961	3.83	1.23	—	*.846*	*.688*	*.658*	*.733*	*.788*	*.441*
F2 Self-Growth	9	.942	4.35	1.10	.780	—	*.792*	*.785*	*.893*	*.745*	*.669*
F3 Relaxation	3	.920	4.62	1.21	.615	.677	—	*.691*	*.783*	*.672*	*.680*
F4 Curiosity	3	.918	4.80	1.26	.578	.683	.616	—	*.698*	*.792*	*.700*
F5 Surprise	3	.899	4.25	1.25	.630	.739	.624	.591	—	*.634*	*.545*
F6 Nostalgia	3	.927	4.20	1.41	.694	.629	.595	.658	.528	—	*.511*
F7 Everyday Fit	10	.931	5.22	0.95	.396	.573	.614	.646	.472	.442	—

Note. Below the diagonal: Pearson correlations of the observed scores (n = 1,054; all p < .001). Above the diagonal (italic): latent-variable correlations from the final CFA model (n = 374).

3.4. Temporal stability of factor scores

For the valid data of the test-retest reliability analysis (n = 194), the intraclass correlation coefficient between Survey 1 and Survey 2 was analyzed (Table 5). ICC(2,1) ranged from .592 for F5 “Surprise” to .786 for F7 “Everyday Fit”, and all were significant (p < .001). In addition, the main effect of the measurement occasion was not significant for any factor, and no systematic change was observed in the mean factor scores.

Table 5. Test-retest reliability of factor scores (n = 194)

Factor	Items	ICC(2,1)	95% CI lower	95% CI upper	Survey 1 M	Survey 1 SD	Survey 2 M	Survey 2 SD	Difference (Survey 2 − 1)	F(1,193)	p (time)
F1 Social Fulfillment	13	.755	.687	.810	3.93	1.18	3.98	1.09	+0.05	0.86	.356
F2 Self-Growth	9	.697	.617	.763	4.40	1.11	4.36	0.92	-0.05	0.63	.429
F3 Relaxation	3	.607	.510	.689	4.78	1.15	4.71	1.04	-0.08	1.17	.281
F4 Curiosity	3	.696	.615	.762	4.91	1.16	4.94	1.10	+0.02	0.12	.725
F5 Surprise	3	.592	.492	.676	4.24	1.19	4.26	1.02	+0.02	0.07	.793
F6 Nostalgia	3	.705	.626	.769	4.37	1.28	4.36	1.27	-0.01	0.04	.846
F7 Everyday Fit	10	.786	.725	.834	5.35	0.83	5.30	0.82	-0.05	1.45	.229

Note. ICC(2,1): two-way random-effects model, absolute agreement, single measures. Time difference: F and p for the effect of measurement occasion (rater factor) in a two-way ANOVA. All ICCs: p < .001.

3.5. Differences in factor scores between satisfaction groups

When the factor scores of the satisfied group (n = 95) and the less satisfied group (n = 56) were compared, the satisfied group scored higher than the less satisfied group on all seven factors (Fig. 2). Independent-samples t-tests showed that the differences were significant for all factors (t(149) = 5.77 to 13.20, all p < .001). The effect sizes (Cohen’s d) ranged from 0.97 for F5 “Surprise” to 2.22 for F7

"Everyday Fit", and all were large.

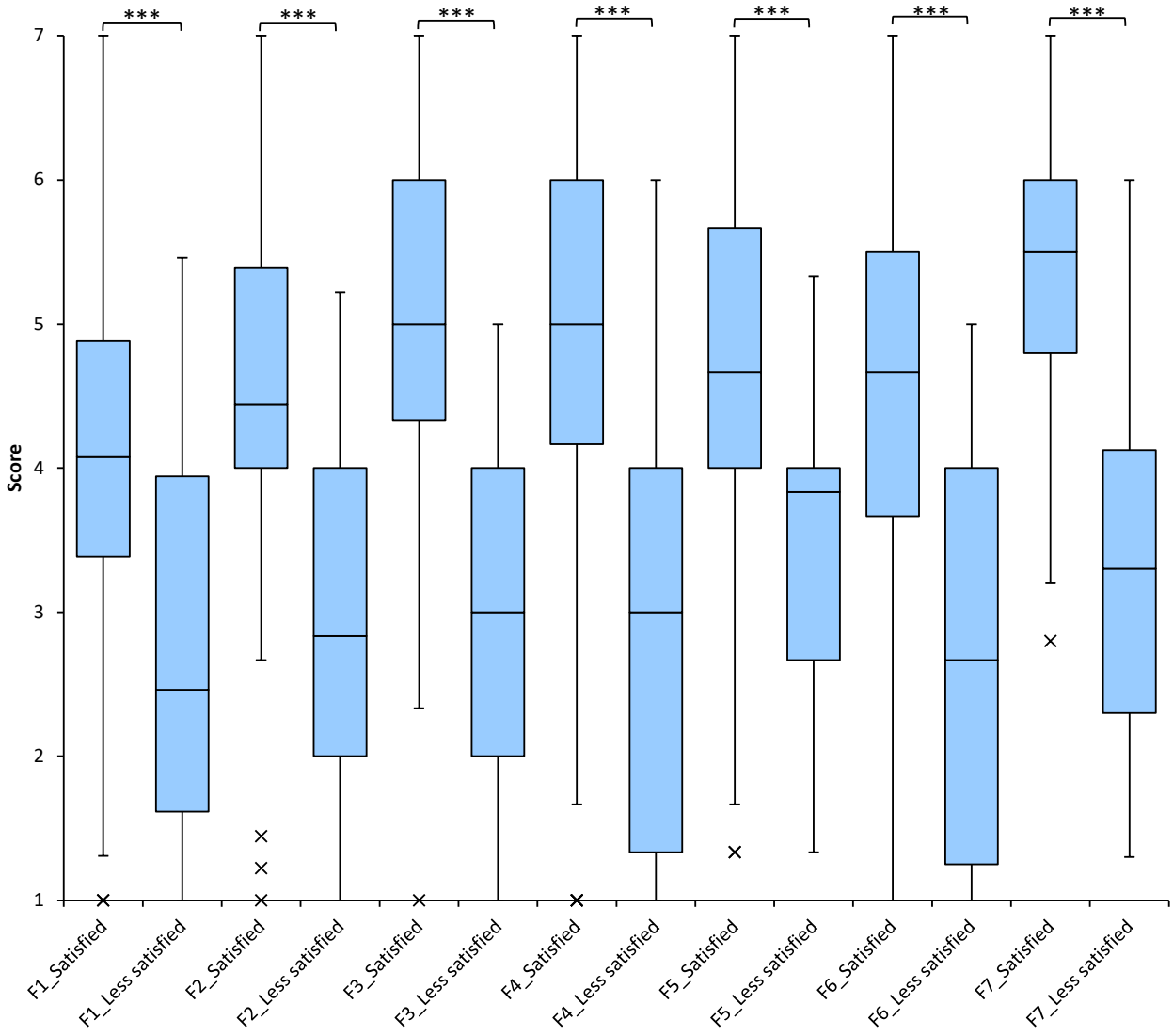


Fig 2. Distributions of factor scores of the satisfied group (n = 95) and the less satisfied group (n = 56). Boxes show the interquartile range, lines show the median, whiskers show the range within 1.5 IQR, and × indicates outliers. ***: $p < .001$.

4. Discussion

4.1. Psychometric properties of the proposed scale

In this study, the Experiential Value Assessment Scale, with seven factors and 44 items, was constructed through stepwise item deletion by exploratory factor analysis (EFA). This seven-factor structure was also supported by confirmatory factor analysis (CFA) in a sample (n = 374) different from the one used for the EFA. The standardized factor loadings were high for all items, ranging from .554 to .922 (mean = .816), and RMSEA = .078 and SRMR = .061 were both below the commonly referred value of .08. CFI = .881 and TLI = .871 did not quite reach .90. Considering that the model is

relatively complex, with seven factors and 44 items, the results are generally acceptable as evidence for the replicability of the structure. The six error covariances that were added were limited to item pairs whose content was close within the same factor, such as *life_integration* and *daily_habit*, and *family_friend_bond* and *connection_joy*, and they did not change the factor structure itself. Furthermore, the seven-factor model fit better than the models that merged highly correlated factor pairs, the one-factor model, and the second-order factor model (Table 3). This provides some support for treating the factors separately. However, discriminant validity was limited for some factor pairs, such as Self-Growth (F2) and Surprise (F5).

Internal consistency was high for all factors (α = .899 to .961), and it was .899 to .927 even for the factors with three items (F3 to F6). This suggests that each factor can be measured stably even with a small number of items. For F1 (13 items) and F7 (10 items), which have many items, there is room for shortening in the future.

Test-retest reliability in 194 respondents was ICC(2,1) = .755 for F1, .697 for F2, .607 for F3, .696 for F4, .592 for F5, .705 for F6, and .786 for F7, which was generally at a good level overall. There was no significant difference in the mean scores between the two occasions, and no systematic change was found. By factor, Relaxation (F3) and Surprise (F5) were relatively low. These may be values that are easily affected by the situation of use or recent events. This can be interpreted as a difference in the nature of the values, separately from measurement error.

In the comparison between the satisfied and less satisfied groups, the satisfied group scored significantly higher on all seven factors, and the effect sizes were large (d = 0.97 to 2.22). This indicates that the scores of this scale reflect differences in experience that correspond to differences in overall satisfaction. The differences were particularly large for F7 (d = 2.22) and F3 (d = 1.81), which suggests that Everyday Fit and Relaxation are values that are easily linked to satisfaction. Note that this comparison does not examine whether each factor can differentiate experiences that differ in that specific type of value.

4.2. Interpretation of the experiential value dimensions

Among the seven factors, F1 includes *social_contribution*, *environmental_care*, *peer_recognition*, and *family_friend_bond*, and represents the value that use brings in relation to others and society outside oneself. F2 relates to growth of the self and a sense of competence through use, with items such as *accomplishment*, *self_confidence*, *self_expression*, *creative_expression*, and *challenge*. F3 (Relaxation), F4 (Curiosity), F5 (Surprise), and F6 (Nostalgia) all represent emotional and cognitive experiences that arise during use, but it is notable that each emerged as an independent factor. F7 captures the aspect of the process in which a product becomes rooted in daily life and becomes something one cannot do without. These dimensions have in common that they describe what users feel they gained as a result of use, based on users' own descriptions, rather than the functions or performance of the product itself.

Comparing the seven factors of this study with the 30 categories obtained by the sentence

completion test (Doi, 2026), the following points can be made. First, multiple categories were integrated into larger factors. F1 includes the categories “Social connectedness,” “Environmental and social consciousness,” “Social recognition,” and “Interpersonal warmth,” as well as content derived from “Personal appearance.” Each of these had a small number of descriptions as an individual category, but they seem to have come together as one factor because of their shared meaning: the value that use brings in relation to others and society. F2 corresponds to “Personal growth,” “Self-efficacy,” “Self-expression,” and “Creativity,” and these came together with the shared meaning of the growth of the self through use. F7 includes “Integration into everyday life” and “Attachment,” as well as content derived from “Usability,” “Trust and reassurance,” and “Alignment with personal values and beliefs.” These are captured as a continuum with the shared feature of “fitting into one’s life.”

Second, some categories remained almost as they were as factors. F3 corresponds to “Relaxation,” F5 to “Emotional impact and surprise,” and F6 to “Nostalgia,” and F4 is close to “New encounters and discoveries” and “Learning.”

Third, some categories did not correspond to any factor. “Value for money,” “Time efficiency,” “Removal of inconvenience,” “Health,” and “Gustatory pleasure” did not appear as independent factors. In addition, “Satisfaction and fulfillment” is difficult to distinguish from overall satisfaction, and “Enjoyment” and “Comfort” also did not become independent factors. These categories are close to evaluations of product attributes such as performance and cost-effectiveness, or to general favorable evaluations. They can be interpreted as different in nature from the kind of value that concerns what relationships with whom, or what changes, were brought about as a result of use.

Fourth, the number of descriptions in the sentence completion test does not necessarily correspond to the strength of a factor. “Enjoyment” and “Usability” had many descriptions, whereas “Social recognition” and “Environmental and social consciousness,” which had few descriptions, formed part of F1. This shows that how often something is mentioned in free descriptions does not necessarily match the dimensions that can be measured independently as a rating scale.

Many previous studies have also examined the dimensions on which positive experiences can be understood. Hassenzahl et al. (2010) analyzed more than 500 positive experiences and reported that stimulation, relatedness, competence, and popularity are important. Mekler and Hornbæk (2016, 2019) examined the difference between eudaimonic and hedonic experiences, as well as dimensions related to the meaning of experience (connectedness, purpose, coherence, resonance, and significance). F2 (Self-Growth) and F1 (Social Fulfillment) in this study may partly overlap in content with the dimensions shown by these studies, such as competence, relatedness, and meaning-making. They also partly correspond to scales such as the FUN Scales (Huang et al., 2025), which were designed deductively on the basis of psychological needs, and to the EVS (Mathwick et al., 2001) and CEXPVALS (Varshneya & Das, 2017), which measure consumer value divided into cognitive, hedonic, social, and ethical aspects. On the other hand, Relaxation, Curiosity, Surprise, and Nostalgia, which were obtained as independent factors F3 to F6 in this study, are often treated as parts of larger dimensions in these frameworks, or are not explicitly included. In addition, F7 includes aspects related

to what Karapanos et al. (2009) described in prolonged use, namely the product becoming meaningful in daily life, being associated with daily routines, and attracting emotional attachment.

Taken together, the scale in this study does not conflict with existing theories and scales. It can be positioned as a complementary attempt to measure dimensions obtained inductively from free descriptions while relating them to existing frameworks. However, the correspondence with previous studies is an interpretation based on a comparison of item content. It was not tested by administering both measures to the same respondents.

The final purpose of this study was to build a scale that can be applied to comparing the experiential value that users feel through product use. As a step toward this, this study confirmed basic properties: the construction of the scale, its reliability, and its ability to differentiate groups with different satisfaction. On the other hand, the seven-factor perspective and the scale have not yet been used in the evaluation of UX of actual products, and they have not been validated in actual use. Therefore, although this study cannot be said to have achieved the final purpose, it can be positioned as a stage in which the foundation of the scale has been prepared.

4.3. Implications for UX evaluation

This scale expresses what kind of value users feel they gain through the use of a product, as scores on seven dimensions. Using this set of scores (an experiential value profile), the following uses are conceivable. First, it can be used to check the fit with the design concept. For example, F3 and F7 would be expected to be high for a product designed around relaxation and reassurance, and F4 and F5 for a product intended to offer new experiences. If there is a gap between the intended value and the value that users actually feel, it can serve as a clue for examining design issues. Second, it can be used to compare products or functions. Even for products with similar overall satisfaction, the value profiles may differ, and it may be possible to compare what kinds of value support the satisfaction. Third, it can be used to compare groups of users or stages of use for the same product. This study did not examine changes over time, but the absence of systematic shifts in the test-retest data is one of the preconditions for using the same scale repeatedly.

These uses do not replace existing scales that evaluate product quality and impressions during use, such as AttrakDiff, the UEQ, and the meCUE 2.0. Existing scales mainly capture impressions during or immediately after use, whereas this scale asks about the experiential value that users feel they have gained from the experience of using a product itself. Using both together may make it possible to understand the characteristics of a product and the value that users gain from it. However, none of the above uses has been tested in this study. Whether differences in profiles correspond to differences in actual product characteristics or actual use needs to be confirmed in future studies with specific products.

4.4. Limitations and future research

This study has several limitations. Regarding the factor structure, the CFA fit indices of CFI = .881

and TLI = .871 did not quite reach .90, and six error covariances were added. Although the seven-factor structure received some support in a different sample, there is room to improve the model fit. In future studies, the replicability of the structure should be examined in further samples, and the fit should be improved through a closer review of the item content. The factors were also highly correlated (up to .893 between latent variables), and discriminant validity was limited, especially between Self-Growth (F2) and Surprise (F5), and between Social Fulfillment (F1) and Self-Growth (F2). The seven-factor model fit better than the models that merged these pairs. However, even when F2 and F5 were merged, CFI decreased only by .008, and the HTMT was .894. This should be examined in another sample, including the relationship between the item contents of the two factors.

Evidence for validity is also limited. The comparison between the satisfied and less satisfied groups only showed that the factor scores tended to be higher for satisfying experiences. It did not examine whether each factor can differentiate experiences that differ in that specific type of value. Future studies should compare experiences that are expected to differ in each type of value. In addition, the product categories were not evenly distributed between the two groups, and the exclusion rate was high. Validity was not examined by administering the scale together with existing scales such as the meCUE 2.0 (convergent and discriminant validity).

The scope of application is limited in several ways. The product categories that respondents chose may have been biased, and whether the factor structure or scores differ by type of product was not examined. The survey targeted products that respondents had used for six months or longer, in order to capture the experience of continued use rather than momentary impressions. Whether the scale works for shorter use, such as the early stage of use, was not examined. Moreover, the respondents were limited to Japanese speakers in Japan, so applying the scale in other languages or cultures requires translation and validation.

Finally, the burden of 44 items on respondents is large. Item content is thought to overlap within F1 (13 items) and F7 (10 items), and considering the high α, a short version should be examined. In developing a short version, it is desirable to proceed together with additional surveys covering more product categories, an examination of relationships with existing scales, and validation of applications to actual use and function comparison.

5. Conclusion

This study attempted to develop a scale that measures the value that users feel they gain through the use of a product (experiential value). From candidate items based on free descriptions, the Experiential Value Assessment Scale, consisting of 44 items in seven factors (Social Fulfillment, Self-Growth, Relaxation, Curiosity, Surprise, Nostalgia, and Everyday Fit), was constructed through item selection by exploratory factor analysis. In the confirmatory factor analysis with a different sample, the seven-factor structure was supported at a certain level. The internal consistency of each factor was high (α = .899 to .961), and generally good stability was obtained in the retest in which respondents answered about the same product (ICC(2,1) = .592 to .786). In addition, large differences in scores were found

on all factors between the satisfied and less satisfied groups (d = 0.97 to 2.22).

From the above, the scale is considered to have basic properties for capturing experiential value as scores on seven dimensions. On the other hand, future tasks include improving the CFA fit, examining discriminant validity among the factors, examining the relationships with existing scales, validating the scale with a wider range of product categories, languages, and cultures, and shortening the number of items. After these steps, the next stage is to validate its application to comparing actual use and functions of products.

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Appendix A

Candidate pool of 68 items and item selection results (EFA data, *n*=680)

No.	Abbreviation	Item (English translation)	Result	Final factor	Reason for deletion
1	effortless_realization	I was able to do what I wanted without hassle.	Retained	Everyday Fit	
2	intuitive_use	I could use it intuitively without getting confused.	Retained	Everyday Fit	
3	long_term_trust	I feel I can keep using it for a long time with peace of mind.	Retained	Everyday Fit	
4	trust_in_crisis	I felt reassured that I could rely on it when it mattered.	Deleted		Conceptually inappropriate
5	cost_performance	I think it offers high cost performance.	Deleted		Low communality (.344)
6	affordability	I feel it is economically advantageous.	Deleted		Low communality (.331)
7	time_saving	I was able to save a great deal of my time and effort.	Deleted		Cross-loading (F1, F4)
8	effort_reduction	Tasks that used to be troublesome became surprisingly easy.	Deleted		Loading < .40 (.399)
9	problem_resolution	I was able to resolve inconveniences and worries I had had.	Deleted		Cross-loading (F1, F4)
10	freedom_from_constraints	I feel I was freed from previous constraints.	Deleted		Loading < .40; conceptually ambiguous
11	immersion	I sometimes became absorbed and lost track of time.	Deleted		Loading < .40 (.328)
12	engaging_charm	It has an appeal that makes me want to savor it fully.	Deleted		Global evaluative concept; fit no factor
13	exceeded_expectations	It exceeded my expectations, and my impression changed	Retained	Surprise	

		greatly from before I used it.			
14	positive_surprise	There were pleasantly surprising events.	Retained	Surprise	
15	reframing	My preconceptions were overturned.	Retained	Surprise	
16	tidiness	My surroundings and mood became neat and clear.	Deleted		Loading < .40
17	discomfort_relief	Discomfort was removed and I could spend my time comfortably.	Deleted		Loading < .40
18	relaxation	My mind became calm and I could relax.	Retained	Relaxation	
19	tension_relief	I had time when the tension in my mind and body eased.	Retained	Relaxation	
20	healing	It gives me a moment of healing.	Retained	Relaxation	
21	knowledge_gain	I gained new knowledge and insights.	Deleted		Cross-loading (F1, F3)
22	broadened_view	I feel my outlook and way of thinking have broadened.	Deleted		Cross-loading (F1, F3)
23	overcoming_weakness	I became able to do things I was not good at, and I feel my own growth.	Retained	Self-Growth	
24	challenge	I was able to take on new challenges, overcoming my anxiety.	Retained	Self-Growth	
25	style_fit	I feel it fits my preferences and style.	Retained	Everyday Fit	
26	self_expression	I was able to be myself.	Retained	Self-Growth	
27	self_confidence	I gained confidence that "I can do it."	Retained	Self-Growth	
28	accomplishment	I felt a sense of accomplishment ("I did it," "it went well").	Retained	Self-Growth	

29	positive_self_view	I came to feel positive about myself.	Retained	Self-Growth	
30	creative_use	There was enjoyment in using it with my own ingenuity.	Retained	Self-Growth	
31	customization	There was enjoyment in making or arranging things my own way.	Retained	Self-Growth	
32	creative_expression	I felt I could express myself freely.	Retained	Self-Growth	
33	value_alignment	I feel it matches my values and beliefs.	Deleted		Cross-loading (F1, F5)
34	meaningful_choice	I feel it was meaningful to me.	Retained	Everyday Fit	
35	deepened_values	I feel my values have deepened.	Deleted		Loading < .40
36	aesthetic_pleasure	I felt the joy of encountering beautiful things.	Deleted		Global evaluative concept; fit no factor
37	sensitivity_refinement	I feel my sensibilities have been refined.	Deleted		Global evaluative concept; fit no factor
38	health_improvement	My physical and mental condition is better than before.	Deleted		Conceptual mismatch (loaded on F2 but dissimilar in content)
39	healthy_lifestyle	I feel I am living a healthy life.	Deleted		Conceptual mismatch (loaded on F2 but dissimilar in content)
40	sensory_fulfillment	My five senses were satisfied.	Deleted		Conceptual mismatch (fit no factor)
41	enhanced_attractiveness	I feel my own attractiveness has increased.	Retained	Social Fulfillment	
42	well_groomed	I feel my appearance is well put together.	Retained	Social Fulfillment	

43	family_friend_bond	My relationships with family and friends have deepened.	Retained	Social Fulfillment	
44	connection_joy	I felt the joy of connecting and sharing with others.	Retained	Social Fulfillment	
45	social_trigger	It gave me a chance to interact with someone.	Retained	Social Fulfillment	
46	environmental_care	I feel it is a choice that shows consideration for the environment and society.	Retained	Social Fulfillment	
47	social_contribution	I feel my actions are useful to society.	Retained	Social Fulfillment	
48	peer_recognition	I felt recognized by the people around me.	Retained	Social Fulfillment	
49	ownership_pride	I feel proud to have made this experience my own.	Retained	Social Fulfillment	
50	social_esteem	I feel it is valued by the people around me.	Retained	Social Fulfillment	
51	others_warmth	I felt the warmth and kindness of others.	Retained	Social Fulfillment	
52	heart_warmth	My heart felt warm.	Retained	Social Fulfillment	
53	gratitude	Feelings of gratitude arose naturally.	Retained	Social Fulfillment	
54	indispensable	It has become something I can no longer let go of.	Retained	Everyday Fit	
55	life_integration	It has become a part of my daily life.	Retained	Everyday Fit	
56	daily_habit	It has become indispensable to my daily routine.	Retained	Everyday Fit	
57	novelty	It had a novelty I had not experienced before.	Deleted		Loading < .40 (split across F3 and F6)
58	fresh_surprise	I experienced a fresh sense of surprise.	Deleted		Loading < .40 (split across F3 and F6)

59	choice_freedom	I had the freedom to choose what I liked whenever I liked.	Deleted		Cross-loading (F3, F4)
60	repeatable_enjoyment	I could enjoy it repeatedly, whenever I liked.	Deleted		Cross-loading (F3, F4)
61	attachment	I feel attached to it.	Retained	Everyday Fit	
62	long_term_intent	I want to keep valuing it for a long time.	Retained	Everyday Fit	
63	new_encounters	I encountered objects and information I had not known before.	Retained	Curiosity	
64	curiosity_stimulation	It stimulated my curiosity with new discoveries.	Retained	Curiosity	
65	world_expansion	It has become an opportunity to broaden my world.	Retained	Curiosity	
66	memory_evocation	Memories of the past were brought back.	Retained	Nostalgia	
67	nostalgia	I could feel a nostalgic time.	Retained	Nostalgia	
68	memory_bonding	It is connected to my important memories.	Retained	Nostalgia	

Appendix B

Final 44 items with Japanese originals and English translations

No.	Factor	Item (Japanese original)	Item (English translation)
1	F1 Social Fulfillment	この体験を通じて、自分の行動が社会の役に立っていると感じる	I feel my actions are useful to society.
2	F1 Social Fulfillment	この体験を通じて、周囲から認められたと感じる	I felt recognized by the people around me.
3	F1 Social Fulfillment	この体験は、周りの人から評価されていると感じる	I feel it is valued by the people around me.
4	F1 Social Fulfillment	この体験を通じて、他者の温かさや思いやりを感じられた	I felt the warmth and kindness of others.
5	F1 Social Fulfillment	この体験は、環境や社会への配慮ができる選択だと感じる	I feel it is a choice that shows consideration for the environment and society.
6	F1 Social Fulfillment	この体験を通じて、身だしなみが整っていると実感している	I feel my appearance is well put together.
7	F1 Social Fulfillment	この体験を通じて、感謝の気持ちが自然と湧いてきた	Feelings of gratitude arose naturally.
8	F1 Social Fulfillment	この体験は、誰かと交流するきっかけになった	It gave me a chance to interact with someone.
9	F1 Social Fulfillment	この体験を通じて、家族や友人との関わりが深まっている	My relationships with family and friends have deepened.
10	F1 Social Fulfillment	この体験を通じて、自分の魅力が高まっていると感じる	I feel my own attractiveness has increased.
11	F1 Social Fulfillment	この体験を自分のものにしていることに、誇りを感じる	I feel proud to have made this experience my own.
12	F1 Social Fulfillment	この体験では、心がほっと温かくなった	My heart felt warm.
13	F1 Social Fulfillment	この体験を通じて、人とのつながりや共有の喜びを感じられた	I felt the joy of connecting and sharing with others.
14	F2 Self-Growth	この体験では、「できた」「うまくいった」という手応えを感じられた	I felt a sense of accomplishment ("I did it," "it went well").
15	F2 Self-Growth	この体験を通じて、「自分にもできる」という自信が持てた	I gained confidence that "I can do it."
16	F2 Self-Growth	この体験を通じて、自分らしさを発揮できた	I was able to be myself.
17	F2 Self-Growth	この体験では、自由に表現できる手応えを感じた	I felt I could express myself freely.

18	F2 Self-Growth	この体験には、自分なりのやり方で作り出したり、アレンジしたりする楽しみがあった	There was enjoyment in making or arranging things my own way.
19	F2 Self-Growth	この体験を通じて、自分自身への前向きな気持ちを持てた	I came to feel positive about myself.
20	F2 Self-Growth	この体験には、自分なりに工夫して使う楽しみがあった	There was enjoyment in using it with my own ingenuity.
21	F2 Self-Growth	この体験を通じて、苦手だったことができるようになり、自分の成長を実感している	I became able to do things I was not good at, and I feel my own growth.
22	F2 Self-Growth	この体験では、不安を乗り越えて新しいことに挑戦できた	I was able to take on new challenges, overcoming my anxiety.
23	F3 Relaxation	この体験では、心身の緊張がほぐれる時間を得られた	I had time when the tension in my mind and body eased.
24	F3 Relaxation	この体験では、心が穏やかになりリラックスできた	My mind became calm and I could relax.
25	F3 Relaxation	この体験は、自分を癒すひとときを与えてくれる	It gives me a moment of healing.
26	F4 Curiosity	この体験は、新たな発見で自分の好奇心を刺激してくれた	It stimulated my curiosity with new discoveries.
27	F4 Curiosity	この体験を通じて、知らなかった対象や情報に出会えた	I encountered objects and information I had not known before.
28	F4 Curiosity	この体験は、自分の世界が広がるきっかけになっている	It has become an opportunity to broaden my world.
29	F5 Surprise	この体験は予想を超えるもので、利用前からの印象が大きく変わったと感じる	It exceeded my expectations, and my impression changed greatly from before I used it.
30	F5 Surprise	この体験を通じて、これまでの思い込みがくつがえされた	My preconceptions were overturned.
31	F5 Surprise	この体験には、良い意味で驚かされる出来事があった	There were pleasantly surprising events.
32	F6 Nostalgia	この体験では、懐かしい時間を感じることができた	I could feel a nostalgic time.
33	F6 Nostalgia	この体験を通じて、過去の思い出や懐かしい記憶が呼び起こされた	Memories of the past were brought back.
34	F6 Nostalgia	この体験は、自分の大切な思い出と結びついている	It is connected to my important memories.
35	F7 Everyday Fit	この体験は、自分の生活の一部として定着している	It has become a part of my daily life.
36	F7 Everyday Fit	この体験は、日常の習慣に欠かせないものになっている	It has become indispensable to my daily routine.
37	F7 Everyday Fit	この体験は、今ではもう手放せないものになっている	It has become something I can no longer let go of.
38	F7 Everyday Fit	この体験を長く大切に続けたいと思う	I want to keep valuing it for a long time.

39	F7 Everyday Fit	この体験は、安心して長く続けられるものだと感じる	I feel I can keep using it for a long time with peace of mind.
40	F7 Everyday Fit	この体験では、操作で迷うことなく直感的に使えた	I could use it intuitively without getting confused.
41	F7 Everyday Fit	この体験は、自分にとって意味のあるものだったと感じる	I feel it was meaningful to me.
42	F7 Everyday Fit	この体験では、自分のやりたいことを手間なく実現できた	I was able to do what I wanted without hassle.
43	F7 Everyday Fit	この体験は、自分の好みやスタイルにぴったり合っていると感じる	I feel it fits my preferences and style.
44	F7 Everyday Fit	この体験に愛着を感じている	I feel attached to it.